

FROM: 1 to: 4041

[illegible]

301 AsnSerGlnSerIleAsnAspSpleValaLargylsGluaspTyrIleY 317
|||||
3510 AATTCCTCAATCTATAAATGATGATATAGTTACAAAAGACGAATATATATA 3559
|||||
317 rLeuAspPhePheAsnLeuAsnGlnGluTTPatGValYThrTYLysGT 334
|||||
3560 TCTAGATATTTTTAAATTTAAATCAAGAGCTCGAGAGTATATACCTATAAAT 3609
|||||
334 YrPheLYsLYsGluGluGluLYsLeuPheLeuAlaProIleSerAspSor 350
|||||
3610 ATTTTGAGAAAGAGAGAGAAANNTGTTTTTAGCTCTCTATAGTGATCT 3659
|||||
351 ASPLuLeuTYrAsnThrIleGlnIleLYsGluTYrAspGluGlnProTh 367
|||||:::|||||
3660 GATGAGCTTTTACCAATACTATACAATATAAAGAATATGATCAACAGCGAAC 3709
|||||
367 rTYrSerCYsGlnLeuLeuPheLYsLYsAspGluGluSerThrAspGluI 384
|||||
3710 ATATAGTTCTGAGTTGCTTTTTTAAAAAAGATGAAGAAGTACTGTATGAGA 3759
|||||
384 leGlyLeuIleGlyIleHisArgPheTYrGluSerGlyIleValPheGlu 400
|||||
3760 TAGGATTTGATTCGTATTCNTCCTTTCTACCAANTCTGGANTTGATTTGCA 3809
|||||
401 GluTYrLYsAspTYrPheCYsIleSerLYsTrpTYrLeuLYsGluValY 417
|||||
3810 GAGTATAAAGATATTTTTTGTATAGTAAATGCTACTTAAAAAGAGGTAAA 3859
|||||
417 sArgLYsProTYrAsnLeuLYsLeuGlyLYsAsnTrpGlnPheIleProL 434
|||||
3860 AAGAAACCATATANTTTAAATTTGGGATGTAANTCGCGAGTTATTTCCTA 3909
|||||

seq_name: qb_ba:AF295926

seq_documentation_block:

LOCUS	AF295926	3876 bp	DNA	linear	BCT 02-SEP-2001
DEFINITION	Clostridium botulinum neurotoxin type B gene, complete cds.				

ACCESSION AF295926

VERSION AF295926.1 GI:15419707

KEYWORDS
SOURCE
classification
document analysis

SOURCE	ORGANISM
Clostridium botulinum.	Clostridium botulinum
Clostridium botulinum	Clostridium botulinum

ORGANISM: *Clostridium botulinum*
Bacteria: Firmicutes: Bacilli

Clostridium.

REFERENCE 1 (bases 1 to 3876)

AUTHORS Kirma, N., Ferreira, J. L.

TITLE Characterization of six

that contain type B toxin

JOURNAL
REFERENCE
Unpublished
? (pages 1 to 1076)

REFERENCE
AUTHORS
2 (bases 1 to 3876)
Klima, N. Ferrel, J.-L.

AUTHORS KIMURA, N., FERREIRA, J. D.
 TITLE Direct Submission

JOURNAL
Submitted (14-AUG-2000)

University, P.O. Box 401

[illegible]

source 1. .3876

/organism-; Clos

/isolate-1436/

/country=USA:
/db_xref=taxon:/country= USA:
/note="isolated

type: AB*

CDS
1: .3876

/codon_start-1

```
/transl_table=1
```

/product="neuro

/protein_id=AA
SI:36361.1
db:CC:1.1

CT:19--1a1x"qb/

251 AsnAlaGlyAsnLysAsnSerTyrlleLysLeuLysLysAspSerProva 267
 954 AATCGGGGAATAAAATTCATATATTAACATAAAGAAAGATTACCTGT 1003
 267 LGLyGluLeuThrArgSerLysTyrrAsnGlnAsnSerLysTyrlleA 284
 1004 AGGTGAATTTTAACAGTAGCAATATTAATCAAAATTCATAATATAA 1053
 284 AATTCATAGAGATTTTAACTGAGGAGGAGGAGGAGGAGGAGGAGG 300
 1054 ATTATAGAGATTTTAACTGAGGAGGAGGAGGAGGAGGAGGAGG 1103
 301 AsnSerGlnSerLysAsnAspLysValArgLysGluAspTyrlleTy 317
 1104 AATTCATAGATTTTAACTGAGGAGGAGGAGGAGGAGGAGGAGG 1153
 317 rLeuAspPhePheAsnLeuAsnGlnGluTrpArgValTyrrTyrlle 334
 1154 TCTAGATTTTAACTGAGGAGGAGGAGGAGGAGGAGGAGGAGG 1203
 334 yrPheLysLysGluGluLysLeuPheLeuAlaProIleSerAspSer 350
 1204 ATTTTAAAGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG 1253
 351 AspGluLeuTyrrAsnThrIleGlnLysGluTyrrAspGluGlnPro 367
 1254 CATGAGTTTAACTGAGGAGGAGGAGGAGGAGGAGGAGGAGG 1303
 367 rTyrrSerCysGlnLeuPheLysLysAspGluSerThrAspGlu 384
 1304 ATATAGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1353
 384 LeuLysLysGluLysLysGluLysLysGluLysLysGluLysLys 400
 1354 TAGGATTCATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1403
 401 GluTyrrLysAspTyrrPheCysLysLysLysLysLysLysLys 417
 1404 CATGATAAGATTTTAACTGAGGAGGAGGAGGAGGAGGAGG 1453
 417 SARGLYSPOTYRRASNLYSLEULYSLEULYSLEULYSLEULYS 434
 1454 AAGGAACCATATATTTAAATGGGATGTAATGGCGATTTATCTCT 1503
 434 ysAspGluGlyTyrrThrGlu 440
 1504 AAGATGAAGGCTGCACTGAA 1523

seq_name: /SIDS1/gcgdata/hold-sequences/geneseq-emb1/NA1998.DAT-AAV30579

seq_documentation_block:
 AAV30579 standard; DNA; 3876 BP.

AAV30579:
 07-DEC-1998 (first entry)
 Clostridium botulinum type B toxin gene from Danish strain.
 Antitoxin: vaccine; neurotoxin: toxin B; intoxication; immunogen;
 Botulism; BotB; ds.
 Clostridium botulinum serotype B Danish strain.
 W09808540-A1.
 PD-05-MAR-1998.
 28-AUG-1997; 97MO-US15394.
 28-AUG-1996; 96US-0704159.

(OPHI-) OPHIDIAN PHARM INC.

Thalley BS, Williams JA;

WPI: 1998-230234/20.

P-PSDB; NAM68392.

Host cell containing recombinant expression vector encoding
 Clostridium botulinum type B or E toxin - useful to treat humans
 and other animals at risk of intoxication with clostridial toxin
 Example 35; Page 291-296; 428pp; English.

This is the coding region of the Clostridium botulinum serotype B
 (Danish strain) toxin gene that codes for a 1291-amino acid
 polypeptide (see NAM68392). The C fragment (see NAM68394) of the
 B toxin has been expressed as histidine-tagged protein in Escherichia
 coli host cells. The invention relates to C botulinum recombinant
 toxin polypeptides. Methods are provided which allow for the
 isolation of soluble recombinant proteins free of significant
 endotoxin contamination. Preferred hosts for production of the
 recombinant proteins are E. coli, insect cells and yeast cells.
 The recombinant proteins are used as immunogens for the production
 of vaccines and antitoxins that are useful in the treatment of
 humans and animals at risk of intoxication with clostridial toxin.
 Sequence 3876 BP; 1612 A; 370 C; 617 G; 1277 T; 0 Other;

alignment_scores:

Quality: 2333.00 Length: 440

Ratio: 5.326 Gaps: 0

Percent Similarity: 99.545 Percent Identity: 99.318

alignment_block:

US-09-910-186A-8 x AAV30579

Align seg 1/1 to: AAV30579 from: 1 to: 3876

1 MetAlaAsnLysTyrrAsnSerGluLeuLeuAsnAspIleLeuAsnLe 17
 2554 ATGTTTAAATAATAATACGAAATTTAAATAATATATTTCTTAATTT 2603
 17 uArgTyrrLysAspAsnLeuIleAspLeuSerGlyTyrrGlyAlaLysV 34
 2604 AAGATATAAGGATATAATTTAATAGATTATCAGCATATCGGCAAGG 2653
 34 alGluValTyrrAspGlyValGluLeuAsnAspLysAsnGlnPheLysLeu 50
 2654 TAGAGGTATATGATGGAGTCGAGCTTATGNTAATAATCATTTAATTA 2703
 51 ThrSerSerAlaAsnSerLysIleArgValThrGlnAsnGlnAsnIle 67
 2704 ACTAGTTCAGCAATAGTAGATTAGAGTACGCTCAAAATCAGAAATATCAT 2753
 67 ePheAsnSerValPheLeuAspPheSerValSerPheTetPileArgIleP 84
 2754 ATTTAATAGTGTGCTCTCTGATTTTAGCGGTAGCTTTGGATAGAATAC 2803
 84 rOLysTyrrLysAsnAspGlyIleGlnAsnTyrrIleHisnGluTyrrThr 100
 2804 CTAATAATAAGATGATGGTATACAAAATTAATATTATTCATAATCAATATA 2853
 101 IleIleAsnCysMetLysAsnAsnSerGlyTyrrLysIleSerIleArgG 117
 2854 ATAATTAATGATGAATAAATAATTCGGCTCGAAAAATATCTATTAGGG 2903
 117 yAsnArgIleIleThrThrLeuIleAspIleAsnGlyLysThrLysServ 134
 2904 TAATAGGTATATGGACTTTAATGATATTAATGCAAAACCAATCGG 2953
 134 alPhePheGluTyrrAsnIleArgGluAspIleSerGluTyrrIleAsnArg 150

Tue Sep 3 14:28:26 2002

us-09-910-186

2954 TATTTTTTGAATATAACATAAGACAAGATATATCAGAGTATATAAATAGA 3003
151 TrpPhePheValThrIleThrAsnAsnLeuAsnAsnAlaLysIleTyrIle 167
|||||
3004 TGCTTTTTTGAACCTATTACTAATAATTGAATAACGCTAAAAATTATAT 3053
167 eAsnGlyLysLeuGluSerAsnThrAspIleLysAspIleArgGluValI 184
|||||
3054 TAATGGTAAGCTAGAAATCAAATACAGATATTAAAGATATAAGAGAAGTTA 3103
184 leAlaAsnGlyGluIleIlePheLysLeuAspGlyAspIleAspArgThr 200
|||||
3104 TTGCTAATGGTGAAATAATATTAAATTAGATGGTGATATAGATAGAACA 3153
201 GlnPheIleTrpMetLysTyrPheSerIlePheAsnThrGluLeuSerGl 217
|||||
3154 CAATTATTGGATGAAATATTTTCACTATTTTAAATACGGAATTAAAGTCA 3203
217 nSerAsnIleGluGluArgTyrLysIleGlnSerTyrSerGluTyrLeuL 234
|||||
3204 ATCAATATTGAAGAAAGATATAAAATCAATCATATAGCGAATATTTAA 3253
234 ysAspPheTrpGlyAsnProLeuMetTyrAsnLysGluTyrTyrMetPhe 250
|||||
3254 AAGATTTTGGGGAAATCCTTTAATGTACAATAAAGAATATTATATGTTT 3303
251 AsnAlaGlyAsnLysAsnSerTyrIleLysLeuLysLysAspSerProva 267
|||||
3304 AATGCGGGGAATAAAATTCATATATTAACTAAAGAAAGATTACCTGT 3353
267 lGlyGluIleLeuThrArgSerLysTyrAsnGlnAsnSerLysTyrIleA 284
|||||
3354 AGGTGAAATTTTAAACAGTAGCAATATAATCAAATCTAAATATATAA 3403
284 snTyrArgAspLeuTyrIleGlyGluLysPheIleIleArgArgLysSer 300
|||||
3404 ATTATAGAGATTATATATTGGAGAAAAATTATTATAAGAAGAAAGTCA 3453
301 AsnSerGlnSerIleAsnAspAspIleValArgLysGluAspTyrIleTy 317
|||||
3454 AATCTCAATCTATAAATGATGATAGTTAGAAAAGAGATTATATATA 3503
317 rLeuAspPhePheAsnLeuAsnGlnGluTrpArgValTyrThrTyrLys 334
|||||
3504 TCTAGATTTTTTTAATTTAAATCAAGAGTGGAGAGTATATACCTATAAAT 3553
334 yrPheLysLysGluGluGluLysLeuPheLeuAlaProIleSerAspSer 350
|||||
3554 ATTTTAAGAAAGAGGAAGAAAAATGTTTTAGCTCCTATAAGTGATTCT 3603
351 AspGluLeuTyrAsnThrIleGlnIleLysGluTyrAspGluGlnProTh 367
|||||
3604 GATGAGTTTTACAATACTATACAAATAAAGAATATCAATGAACAGCCAAC 3653
367 rTyrSerCysGlnLeuLeuPheLysLysAspGluGluSerThrAspGluI 384
|||||
3654 ATATAGTTGTCTAGTTGCTTTTAAAAAAGATGAAGAAAGTACTGATGAGA 3703
384 leGlyLeuIleGlyIleHisArgPheTyrGluSerGlyIleValPheGlu 400
|||||
3704 TAGGATTGATTGGTATTTCATCGTTTCTACGAATCTGGAATTGATTGAA 3753
401 GluTyrLysAspTyrPheCysIleSerLysTrpTyrLeuLysGluValLy 417
|||||
3754 CAGTATAAAGATTATTTTGTATAAGTAAATGGTACTTAAAGAGGTAAA 3803
417 sArgLysProTyrAsnLeuLysLeuGlyCysAsnTrpGlnPheIleProL 434
|||||
3804 AAGGAAACCATATAATTTAAATTTGGGATGTAATGGCAGTTTATTCCTA 3853
434 ysAspGluGlyTrpThrGlu 440
|||||
3854 AAGATGAAGGCTGGACTGAA 3873

SEQ ID 7

Page 1

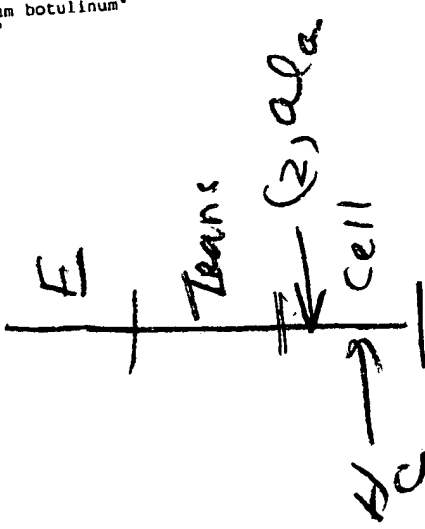
186a-7.rge

1	742.8	55.4	4041	1	CLOBOTB
2	706.4	52.7	3876	1	AF295926
3	706.4	52.7	3876	1	AF300465
4	706.4	52.7	3876	1	AF300466
5	706.4	52.7	11170	1	CBY13630
6	696	51.9	3869	1	AF300467
7	696	51.9	3869	1	AF300468
8	696	51.9	3869	1	AF300469
9	681.1	50.8	1326	1	CBO242628
10	663.4	49.5	4051	1	CBBONTB
11	522.4	39.0	3509	6	A69701
12	522.4	39.0	3509	6	BD009886
13	341	22.4	6862	1	CBNTNHNNTB
14	263	19.6	1330	6	AR000029
15	263	19.6	1330	6	AR169140
16	263	19.6	1330	6	AX036243
17	263	19.6	1338	12	XXU22962
18	263	19.6	1402	6	AR000030
19	263	19.6	1402	6	AR169141
20	263	19.6	1402	6	AX036246
21	242.6	18.1	1313	6	A58946
22	241	18.0	1299	12	AF251281
23	224.8	16.8	1084	1	CBBPOT
24	220.2	16.4	3937	1	CBPONTG
25	212.6	15.9	1084	1	CBP129
26	212.6	15.9	1084	1	CBBERLUND
27	135.4	10.1	4067	1	CBNTOX
28	134.2	10.0	3712	6	A49987
29	131.4	9.8	1359	6	I28431
30	129.4	9.6	4566	6	A42484
31	129.2	9.6	3754	6	A37074
32	129.2	9.6	3754	6	A42478
33	129.2	9.6	3769	6	A37075
34	129.2	9.6	3769	6	A49988
35	129.2	9.6	4378	6	A42481
36	123	9.2	3891	6	AR000031
37	123	9.2	3891	6	AR169142
38	123	9.2	3891	6	AX036248
39	123	9.2	4292	1	CBBOTAG
40	123	9.2	4835	1	CLONEUR
41	103.2	7.7	1766	6	A49989
42	96	7.2	1293	6	A58945
43	96	7.2	4199	1	CLOBONT
44	96	7.2	4209	1	CBBONTFG
45	92.6	6.9	3952	1	CBNTTD

M81186 Clostridium
AF295926 Clostridi
AF300465 Clostridi
AF300466 Clostridi
Y13630 Clostridium
AF300467 Clostridi
AF300468 Clostridi
AF300469 Clostridi
AJ242628 Clostridi
X71343 C.botulinum
A69701 Sequence 19
BD009886 Recombina
X87849 C.botulinum
AR000029 Sequence
AR169140 Sequence
AX036243 Sequence
U22962 Synthetic b
AR000030 Sequence
AR169141 Sequence
AX036246 Sequence
A58946 Sequence 6
AF251281 Synthetic
X70817 C.botulinum
X74162 C.botulinum
X70814 C.botulinum
X70819 C.botulinum
X73423 C.botulinum
A49987 Sequence 4
I28431 Sequence 3
A42484 Sequence 12
A37074 Sequence 17
A42478 Sequence 6
A37075 Sequence 18
A49988 Sequence 5
A42481 Sequence 9
AR000031 Sequence
AR169142 Sequence
AX036248 Sequence
X52066 Clostridium
M30196 C.botulinum
A49989 Sequence 6
A58945 Sequence 5
L35496 Clostridium
X81714 C.botulinum
X54254 Clostridium

ALIGNMENTS

RESULT 1
LOCUS CLOBOTB 4041 bp DNA linear BCT 26-APR-1993
DEFINITION Clostridium botulinum neurotoxin type B (botB) gene, complete cds.
ACCESSION M81186
VERSION M81186.1 GI:144734
KEYWORDS botB gene; neurotoxin type B.
SOURCE Clostridium botulinum DNA.
ORGANISM Clostridium botulinum
Bacteria; Firmicutes; Bacillus/Clostridium group; Clostridiaceae;
Clostridium.
REFERENCE 1 (bases 1 to 4041)
AUTHORS Whelan, S.M., Elmore, M.J., Bodsworth, N.J., Brehm, J.K., Atkinson, T.
and Minton, N.P.
TITLE Complete nucleotide sequence of the Clostridium botulinum gene
encoding the type B neurotoxin
Unpublished (1991)
JOURNAL Location/Qualifiers
FEATURES
source 1. .4041
/organism="Clostridium botulinum"
/db_xref="taxon:1491"
57. .3932
gene /gene="botB"



SEQID8

Page 1

gb_pat:AX088262 + 692.00 761.78 4.6e-34 4017 : AX088262 Sequence 10 from
 gb_ba:AB037704 + 683.00 752.20 1.6e-33 3835 : AB037704 Clostridium butyr
 gb_ba:AB037705 + 683.00 752.20 1.6e-33 3835 : AB037705 Clostridium butyr
 gb_ba:AB037706 + 683.00 752.20 1.6e-33 3835 : AB037706 Clostridium butyr
 gb_ba:AB037707 + 683.00 752.20 1.6e-33 3835 : AB037707 Clostridium butyr

seq_name: gb_ba:CLOBOTB

seq_documentation_block:
 LOCUS CLOBOTB 4041 bp DNA linear BCT 26-APR-1993
 DEFINITION Clostridium botulinum neurotoxin type B (botB) gene, complete cds.
 ACCESSION M81186
 VERSION M81186.1 GI:144734
 KEYWORDS botB gene; neurotoxin type B.
 SOURCE Clostridium botulinum DNA.
 ORGANISM Clostridium botulinum
 Bacteria; Firmicutes; Bacillus/Clostridium group: Clostridiaceae;
 Clostridium.

REFERENCE 1 (bases 1 to 4041)
 AUTHORS Whelan, S.M., Elmore, M.J., Bodsworth, N.J., Brehm, J.K., Atkinson, T.
 and Minton, N.P.
 TITLE Complete nucleotide sequence of the Clostridium botulinum gene
 encoding the type B neurotoxin
 JOURNAL Unpublished (1991)
 FEATURES Location/Qualifiers

source 1. 4041
 /organism="Clostridium botulinum"
 /db_xref="taxon:1491"
 57. 3932
 gene /gene="botB"
 57. 3932
 CDS /gene="botB"
 /function="vertebrate neurotoxin"
 /codon_start=1
 /transl_table=11
 /product="neurotoxin type B"
 /protein_id="AAA23211.1"
 /db_xref="GI:144735"
 /translation="MPVTINNFNYNDPIDNNNIIMPEPPFARGTGRIYKAFKITDRIV
 IIPERYTFGYPEDFNKSSGIFNRDVCYEDPDYLNNDKKNIFLOTNKKFNRIKSK
 PLGEKLEMIINGIPYLGDRRVPLEEFNTIASVTYVKNLISNPGEVERKKGIFANLI
 FGPGPVLNENETIDIGIONHFASREGFGGIMQNKPCPEYVSFNNVQENKGSIFNRR
 GYFSDPALILMHELIHVLHGLYGIKVDLPIVNPNEKFFMOSTDAIOAEELYTFGGOD
 PSIIPTSTDKSIYDKVLQNFGRGIVDRNLKVLVCISDPNININIKKFKDKYKFVEDS
 EGKYSIDVESFDKLYKSLMFGTETNIAENYKIKTRASYFSDSLPPVKIKNLLDNEIY
 TIEEGFNISDKMEKEYRGQNKAINKQAYEIEISKEHLAVYKIQMCKSVKAPGICIDVO
 NEDLFFIADKNSFSDDLKNERIEYNTQSNYIENDFPINELILDITLISKIELPSENT
 ESLLDTPNVDVPVYEKQPAIKKIPTDENTIFQYLYSQTFFLDIRDILSTSSFDALLFS
 NKVYSFFSMYIKTANKVVEAGLFAGWVKQIVNDFVIEANKSNTMDKIDISLIVPYI
 GLALNVGNETAKGNFENAFETAGASILLEFIPELLIPVVGAFLLSEYIDNKNKIKT
 DNALTNRNEKWSMDYGLIVAQLSTYNTQFYTIKEGMYKALNYQAQALEEIKYRYNI
 YSEKEKSNINIDFNINSKLNENINQADINNNFINGCSVSYLKMKMIPLAVEKLLDF
 DNTLKKNLLNYIDENKLYLIGSAEYKSKVKNYKLTIMPFDLSIYNTDITLIEFKNY
 NSEILNNIILNRYKDNLLIDLGSYGAKEVYDGVELNDKNOFKLTSSANSKIRVTQN
 QNIIFNSVFLDFSVSFWRIPKYKNDGIONYIHNEYTIINCMKNNSGWKISIRGNRI
 WTLIDINGTKSVFPEYNIREDISEYINRWFFVTITNNLNNAKIYINGKLESNTDIKD
 IREVIANGEIFKLDGIDIDRTQFIWMKYFSIFNTELSQSNIEERYKIQSYSEYKDFW
 GNPLMYNKYMFNAGNKNSYIKLKDSPVGEILTRSKYNQNSKYINRYDLYIGKFI
 IRRKSNQSINDDIVRKEDYIYLDFFNLQEWRYTYKYFKKEEEKLFAPISDSDEF
 YNTIOIKEYDEQPTYSCQLLFFKDEESTDEIGLIGIRHYESGIVFEETKYDFCISKW
 YLKEVKKRPYNLKLGCNWFIPKDEGWTE"

BASE COUNT 1679 a 383 c 645 g 1334 t
 ORIGIN

alignment_scores:
 Quality: 2340.00 Length: 440
 Ratio: 5.330 Gaps: 0
 Percent Similarity: 99.773 Percent Identity: 99.545

alignment_block:
 US-09-910-186A-8 x CLOBOTB

251 asnaaglyasnlyasnserlyrilelyleuylslyaspserprova 267
|||||
954 aatggcggcaataaanaattcatatataactaaagaaagattcactgt 1005
|||||
267 iglycylleuylrargserlyrileuylasnserlyrileuyl 284
|||||
1004 agtgaatatttaacacacagcaataataatcaaaattctaaatataaa 1053
|||||
284 snfyargasnleuylrileglylylulyspheileilearglysser 300
|||||
1054 attatagagattatatttgcgaaataatttatataacagaaagtca 1103
|||||
301 asnsrserlinsrileasnaspasilevalarglysluasprriley 317
|||||
1104 aattctcaatcatataatgatgatagtttagaaagagattatataa 1153
|||||
317 rleuaspphepheasantleuannglulrtpagvaltyrthrlyst 334
|||||
1154 tctagatttttttaatttaaatcaagagtgagagattatataaccta 1203
|||||
334 yrphelyslysluylulysleuylleuylaleuylaleuylaleuyl 350
|||||
1204 attttaagaaagagaaagaaatgttttttacctctataagtgattct 1253
|||||
351 aspgluylrasnthrileglnilelysluylrleuylaleuylaleuyl 367
|||||
1254 gatgagtttttaactatcaataaataaagaaatagatcaacagccaac 1303
|||||
367 rtyrsercysglnleuylrleuylrleuylrleuylrleuylrleuyl 384
|||||
1304 atataagttgtcagttggttttttaaaaaagatgaagaaagattatgacga 1353
|||||
384 leglyleuylrleuylrleuylrleuylrleuylrleuylrleuyl 400
|||||
1354 taggattatttggtattcatcggttcacgaatctggaattgtatttca 1403
|||||
401 glulrlyasnpyrphelysleuylrleuylrleuylrleuylrleuyl 417
|||||
1404 ggtataaagattatttttctataagtnaatgtctacttaaaagagctaa 1454
|||||
417 arglysprrtyrasnleuylrleuylrleuylrleuylrleuylrleuyl 1503
|||||
1454 aaggaaccatataatttaaaattggatgatttatttgcagttatttcccta 1503
|||||
434 yaspgluylrleuylrleuylrleuylrleuylrleuylrleuyl 440
|||||
1504 aagatgaagcgtgacactgaa 1523
|||||

seq_name: /SIDS1/gcgdata/hold-geneseq/geneseq-emb1/NA1998.DAT:AAV30579

seq_documentation_block:

AAV30579 standard; DNA; 3876 BP.

AAV30579;

07-DEC-1998 (first entry)

Clostridium botulinum type B toxin gene from Danish strain.

Antitoxin; vaccine; neurotoxin; toxin B; intoxication; immunogen;

botulism; BotB; ds.

Clostridium botulinum serotype B Danish strain.

W09808540-AL

05-MAR-1998.

28-AUG-1997; 97WO-US15394.

28-AUG-1996; 96US-0704159.

(OPHI-) OPHIDIAN PHARM INC.

Thalley BS, Williams JA;

WPI; 1998-230234/20.

p-PSDB; AAW68392.

Host cell containing recombinant expression vector encoding Clostridium botulinum type B or E toxin - useful to treat humans and other animals at risk of intoxication with clostridial toxin

Example 35; Page 291-296; 428pp; English.

This is the coding region of the Clostridium botulinum serotype B (Danish strain) toxin gene that codes for a 1291-amino acid polypeptide (see AAW68392). The C fragment (see AAW68394) of the B toxin has been expressed as histidine-tagged protein in Escherichia coli host cells. The invention relates to C. botulinum recombinant toxin polypeptides. Methods are provided which allow for the isolation of soluble recombinant proteins free of significant endotoxin contamination. Preferred hosts for production of the recombinant proteins are E. coli, insect cells and yeast cells. The recombinant proteins are used as immunogens for the production of vaccines and antitoxins that are useful in the treatment of humans and animals at risk of intoxication with clostridial toxin.

Sequence 3876 BP; 1612 A; 370 C; 617 G; 1277 T; 0 other;

alignment_scores:

Quality: 2333.00 Length: 440

Ratio: 5.326 Gaps: 0

Percent Similarity: 99.345 Percent Identity: 99.318

alignment_block:

US-09-910-186a-8 x AAV30579

Align seg 1/1 to: AAV30579 from: 1 to: 3876

1 MetAlaAsnLysTyTyrAsnSerGluileuAsnAsnIleileuAsnLe 17
|||||
2554 ATGTTTAAATAATAATAATAGCGAAATTTTAAATAATAATATCTTAATTTT 2603
|||||
17 uargtyrlysnaspasnAsnLeuileaspLeuSerGlyTyrGlyAlaLysV 34
|||||
2604 AAGATATAAGGATATAATAATTAAATAGATTATTCAGGATATGGGCAAGG 2653
|||||
34 algluValTyTyrAspGlyValGluLeuAsnAsnLysAsnGlnPheLysLeu 50
|||||
2654 TAGAGCTATATGATGGAGTCGAGCTTAATCATAAATCAATTTAAATTA 2703
|||||
51 ThrSerSerAlaAsnSerLysIleArgValThrGlnAsnGlnAsnIleil 67
|||||
2704 ACTAGTTCAGCAATAGTAGATTAGAGTACGACCAAAATCAGAAATATCAT 2753
|||||
67 ePheAsnSerValPheLeuAspPheSerValSerPheTyrPheArgIleP 84
|||||
2754 ATTTAATAGTGTGTTCTTTCGATTTTAGCGTTAGCTTTTGGATAAGAATAC 2803
|||||
84 rOLysTyTyrLysAsnAspGlyilecIlnAsnTyTyrIleHisAsnGluTyThr 100
|||||
2804 CTAAATATAAGCAATGATGGTATACAAATTTATTCATTAATGAATATACA 2853
|||||
101 IleIleAsnCysMetLysAsnAsnSerGlyTyrPheIleSerIleArgGl 117
|||||
2854 ATAATTTAATTTGATCAAAATAATTCGGCTCGCAAAATATCTATTAGGGG 2903
|||||
117 yasnArgIleileTrpThrLeuileaspIleAsnGlyLysThrLysServ 134
|||||
2904 TAATAGGATAATATGGACTTTTAATTCATATAATGCAAAACCAATCGG 2953
|||||
134 alPhePheGluTyTyrAsnIleArgGluAspIleSerGluTyTyrIleAsnArg 150
|||||

Tue Sep 3 14:28:26 2002

us-09-910-186

2954 TATTTTTGAATATAACATAAGACAAGATATATCAGAGTATATAAATAGA 3003
151 TrpPhePheValThrIleThrAsnAsnLeuAsnAsnAlaLysIleTyrI 167
3004 TGGTTTTTGTAACTATTACTAATAATTGAATAACGCTAAAATTTATAT 3053
167 eAsnGlyLysLeuGluSerAsnThrAspIleLysAspIleArgGluValI 184
3054 TAATGGTAAGCTAGAATCAAATACAGATATTAAAGATATAAGAGAAGTTA 3103
184 leAlaAsnGlyGluIleIlePheLysLeuAspGlyAspIleAspArgThr 200
3104 TTGCTAATGGTGAAATAATATTAAATTAGATGGTCATATAGATAGAACA 3153
201 GlnPheIleTrpMetLysTyrPheSerIlePheAsnThrGluLeuSerG 217
3154 CAATTTATTGGATGAATATTTTCACTATTTTAAACGGAATTAAAGTCA 3203
217 nSerAsnIleGluGluArgTyrLysIleGlnSerTyrSerGluTyrLeu 234
3204 ATCAAAATTTGAAGAAAGATATAAAATTCATCATATAGCGAATATTTAA 3253
234 ysAspPheTrpGlyAsnProLeuMetTyrAsnLysGluTyrTyrMetPhe 250
3254 AAGATTTTGGGGAAATCCTTAAATGTACAATAAGAAATATTATATGTTT 3303
251 AsnAlaGlyAsnLysAsnSerTyrIleLysLeuLysLysAspSerProVa 267
3304 AATGCGGGGAATAAAATTCATATATTAACTAAAGAAAGATTCACCTGT 3353
267 lGlyGluIleLeuThrArgSerLysTyrAsnGlnAsnSerLysTyrIleA 284
3354 AGGTGAAATTTTAAACAGTAGCAATATAATCAAAATCTAAATATATAA 3403
284 snTyrArgAspLeuTyrIleGlyGluLysPheIleIleArgArgLysSer 300
3404 ATTATAGAGATTATATATTGGAGAAAAATTTATTATAAGAAGAAAGTCA 3453
301 AsnSerGlnSerIleAsnAspAspIleValArgLysGluAspTyrIleTy 317
3454 AATTCTCAATCTATAAATGATGATATAGTTAGAAAAGAAGATTATATATA 3503
317 rLeuAspPhePheAsnLeuAsnGlnGluTrpArgValTyrThrTyrLys 334
3504 TCTAGATTTTTTAAATTTAAATCAAGAGTGGAGAGTATATACCTATAAAT 3553
334 yrPheLysLysGluGluGluLysLeuPheLeuAlaProIleSerAspSer 350
3554 ATTTTAAGAAAGAGGAAGAAAAATGTTTTAGCTCCTATAAGTGATTCT 3603
351 AspGluLeuTyrAsnThrIleGlnIleLysGluTyrAspGluGlnProTh 367
3604 GATGAGTTTACAACTACTATACAAATAAAGAATATCATGAACAGCCAAC 3653
367 rTyrSerCysGlnLeuLeuPheLysLysAspGluGluSerThrAspGluI 384
3654 ATATAGTTGTCAGTTGCTTTTTAAAAAAGATGAAGAAAGTACTGATGAGA 3703
384 leGlyLeuIleGlyIleHisArgPheTyrGluSerGlyIleValPheGlu 400
3704 TAGGATTGATTGGTATTCATCGTTTCTACGAATCTGGAATTGTATTGAA 3753
401 GluTyrLysAspTyrPheCysIleSerLysTrpTyrLeuLysGluValLy 417
3754 GAGTATAAGATTATTTTGTATAAGTAAATGGTACTTAAAGAGGTAAA 3803
417 sArgLysProTyrAsnLeuLysLeuGlyCysAsnTrpGlnPheIleProL 434
3804 AAGGAAACCATATAAATTAAATTTGGGATGTAATTGGCAGTTTATTCCTA 3853
434 ysAspGluGlyTrpThrGlu 440
3854 AAGATGAAGGGTGGACTGAA 3873

SEQ ID 7

Page 1

186a-7.rge

1	742.8	55.4	4041	1	CLOBOTB	M81186 Clostridium
2	706.4	52.7	3876	1	AF295926	AF295926 Clostridi
3	706.4	52.7	3876	1	AF300465	AF300465 Clostridi
4	706.4	52.7	3876	1	AF300466	AF300466 Clostridi
5	706.4	52.7	11170	1	CBY13630	Y13630 Clostridium
6	696	51.9	3869	1	AF300467	AF300467 Clostridi
7	696	51.9	3869	1	AF300468	AF300468 Clostridi
8	696	51.9	3869	1	AF300469	AF300469 Clostridi
9	681.4	50.8	1326	1	CBO242628	AJ242628 Clostridi
10	663.4	49.5	4051	1	CBBONTB	X71343 C.botulinum
11	522.4	39.0	3509	6	A69701	A69701 Sequence 19
12	522.4	39.0	3509	6	BD009886	BD009886 Recombina
13	341	27.4	6862	1	CBNTNHTB	X87849 C.botulinum
14	263	19.6	1330	6	AR000029	AR000029 Sequence
15	263	19.6	1330	6	AR169140	AR169140 Sequence
16	263	19.6	1330	6	AX036243	AX036243 Sequence
17	263	19.6	1338	12	XXU22962	U22962 Synthetic b
18	263	19.6	1402	6	AR000030	AR000030 Sequence
19	263	19.6	1402	6	AR169141	AR169141 Sequence
20	263	19.6	1402	6	AX036246	AX036246 Sequence
21	242.6	18.1	1313	6	A58946	A58946 Sequence 6
22	241	18.0	1299	12	AF251281	AF251281 Synthetic
23	224.8	16.8	1084	1	CBBPOT	X70817 C.botulinum
24	220.2	16.4	3937	1	CBBONTG	X74162 C.botulinum
25	212.6	15.9	1084	1	CBB129	X70814 C.botulinum
26	212.6	15.9	1084	1	CBBKXND	X70819 C.botulinum
27	135.4	10.1	4067	1	CBNTOX	X73423 C.botulinum
28	134.2	10.0	3712	6	A49987	A49987 Sequence 4
29	131.4	9.8	1359	6	I28431	I28431 Sequence 3
30	129.4	9.6	1866	6	A42484	A42484 Sequence 12
31	129.2	9.6	3754	6	A37074	A37074 Sequence 17
32	129.2	9.6	3754	6	A42478	A42478 Sequence 6
33	129.2	9.6	3769	6	A37075	A37075 Sequence 18
34	129.2	9.6	3769	6	A49988	A49988 Sequence 5
35	129.2	9.6	4378	6	A42481	A42481 Sequence 9
36	123	9.2	3891	6	AR000031	AR000031 Sequence
37	123	9.2	3891	6	AR169142	AR169142 Sequence
38	123	9.2	3891	6	AX036248	AX036248 Sequence
39	123	9.2	4292	1	CBBOTAG	A52066 Clostridium
40	123	9.2	4835	1	CLONEUR	M30196 C.botulinum
41	103.2	7.7	1766	6	A49989	A49989 Sequence 6
42	96	7.2	1293	6	A58945	A58945 Sequence 5
43	96	7.2	4199	1	CLOBONT	L35496 Clostridium
44	96	7.2	4209	1	CBBONTFC	X81714 C.botulinum
45	92.6	6.9	3952	1	CBNTTD	X54254 Clostridium

ALIGNMENTS

RESULT 1
 CLOBOTB 4041 bp DNA linear BCT 26-APR-1993
 LOCUS Clostridium botulinum neurotoxin type B (botB) gene, complete cds.
 DEFINITION M81186
 ACCESSION M81186.1 GI:144734
 VERSION botB gene; neurotoxin type B.
 KEYWORDS Clostridium botulinum DNA.
 SOURCE Clostridium botulinum
 ORGANISM Bacteria; Firmicutes; Bacillus/Clostridium group; Clostridiaceae; Clostridium.
 REFERENCE 1 (bases 1 to 4041)
 AUTHORS Whelan, S.M., Elmore, M.J., Bodsworth, N.J., Brehm, J.K., Atkinson, T. and Minton, N.P.
 TITLE Complete nucleotide sequence of the Clostridium botulinum gene encoding the type B neurotoxin
 JOURNAL Unpublished (1991)
 FEATURES
 source Location/Qualifiers
 1..4041
 /organism="Clostridium botulinum"
 /db_xref="taxon:1491"
 57..3932
 /gene="botB"

gb_pat:AX088262 + 692.00 761.78 4.6e-34 4017 1 AX088262 Sequence 10 from
 gb_ba:AB037704 + 683.00 752.20 1.6e-33 3835 1 AB037704 Clostridium butyr
 gb_ba:AB037705 + 683.00 752.20 1.6e-33 3835 1 AB037705 Clostridium butyr
 gb_ba:AB037706 + 683.00 752.20 1.6e-33 3835 1 AB037706 Clostridium butyr
 gb_ba:AB037707 + 683.00 752.20 1.6e-33 3835 1 AB037707 Clostridium butyr

seq_name: gb_ba:CLOBOTB

seq_documentation_block:
 LOCUS CLOBOTB 4041 bp DNA linear BCT 26-APR-1993
 DEFINITION Clostridium botulinum neurotoxin type B (botB) gene, complete cds.
 ACCESSION M81186
 VERSION M81186.1 GI:144734
 KEYWORDS botB gene; neurotoxin type B.
 SOURCE Clostridium botulinum DNA.
 ORGANISM Clostridium botulinum
 Bacteria; Firmicutes; Bacillus/Clostridium group; Clostridiaceae;
 Clostridium.

REFERENCE 1 (bases 1 to 4041)
 AUTHORS Whelan,S.M., Elmore,M.J., Bodsworth,N.J., Brehm,J.K., Atkinson,T.
 and Minton,N.P.
 TITLE Complete nucleotide sequence of the Clostridium botulinum gene
 encoding the type B neurotoxin
 JOURNAL Unpublished (1991)

FEATURES
 source Location/Qualifiers
 1..4041
 /organism="Clostridium botulinum"
 /db_xref="taxon:1491"
 57..3932
 /gene="botB"
 CDS 57..3932
 /gene="botB"
 /function="vertebrate neurotoxin"
 /codon_start=1
 /transl_table=11
 /product="neurotoxin type B"
 /protein_id="AAA23211.1"
 /db_xref="GI:144735"
 /translation="MPVTINNPNYNDPIDNNNIIMPEPPFARCTGRYYKAFKITDRW
 IIPERTYFGYKPEDPNKSSGIFNRDVCYYDPDYLTNDKKNIFLOTWIKLFNRKSK
 PLGEKLEMIINGIPYLGDRRVPLEEFNTIASVTNKLISNPGEVERKKGIFANLI
 FGPGPVLENENETIDIGIONHFASREGFGGIMQKFCPEYVSFNNVOENKASIFNRR
 GYFSDPALILMHELIHVLHGLYGIKVDLPIVNEKKFFMQSTDAIQAEELYTFGGQD
 PSITTPSTDKSIYDKVLQNRGIVDRLNKVLVCISDPNININIKKFKDKYKFVEDS
 EGYSIDVESPDKLYKSLMFGFTETNIAENYKIKTRASYFSDSLPPVKIKNLLDNEIY
 TIEEGFNISDKMEKEYRGONKAINKQAYEEISKEHLAVYKIQMCKSVKAPGICIDVD
 NEDLFFIADKNSFSDLSKNERIEYNTQSNYIENDFPINELILDLDLISKIPLSENT
 ESLTDFNVDVPVYEKQPAIKKIPTDENTIFQYLYSOTFFPLDIRDISLTSFDDALLFS
 NKVYSFFSMDYIKTANKVVEAGLFAGWVKQIVNDFVIEANKSNTMDKIADISLIVPYI
 GLALNVGNETAKGNFENAFETAGASILLEFIPELLIPVVGAFPLESYIDNKNKIKT
 DNALTKRNEKWSMDYGLIVAQWLSTVNTQFYTIKEGMYKALNYQAALAEIYKYRNI
 YSEKEKSNINIDFNDSKLNENINQAINNFINGCSVSLMKMPLAVEKLLDF
 DNTLKKNNLNYIDENKLYLIGSAEYKSKVKNYKLTIMPFDLSIYTNDTILIEFKNY
 NSEILNNIILNRYKDNLDLSGYGAKVEYVDGVELNDKNOPKLTSSANSKIRVTON
 QNIIFNSVFLDFSVSPWIRIPKYKNDGIONYIHNEYTIINCMKNNSGWRISIRGNRII
 WTLIDINGKTKSVFFEYNIREDISEYINRWFFVTITNNLNNAKIYINGKLESNTDIKD
 IREVIANGEIIFKLDGIDRTQFIWKNYFSIFNTELSQSNIEERYKIQSYSEYKDFW
 GNPLMYNKEYYMFNAGKNYSIKLKKDSPVGEILTRSKYNQNSKYINRYDLIGEKF
 IRRKSNQSINDDIVRKEDIYLDFFNLNOEWRVYTYKFKKEEKLFLAPISDSDEF
 YNTIQIKEYDEQPTYSQCLLKKDEESTDEIGLIGHRFYEGSIVFEYKDYFCISKW
 YLKEVKKRPYNLKLGCNMQFIPKDEGWTE"

BASE COUNT 1679 a 383 c 645 g 1334 t
 ORIGIN

alignment_scores:
 Quality: 2340.00 Length: 440
 Ratio: 5.330 Gaps: 0
 Percent Similarity: 99.773 Percent Identity: 99.545

alignment_block:
 US-09-910-186A-8 x CLOBOTB

Align seg-1/1 to: CLOSTRB from: 1 to: 4041

1 MetAlaAsnLysTyrAsnSerGluLeuLeuAsnAsnIleIleLeuAsnLe 17
2610 ATGTTTAAATAATAATACGGAATTTTAAATATATATATATATATATAT 2659
17 MetAlaAsnLysTyrAsnSerGluLeuLeuAsnAsnIleIleLeuAsnLe 34
2660 ACATATAAGCATATAATTAATAGATTATCAGCATATGGGCAAGG 2709
34 aIgluValTyrAspGluValGluLeuAsnAspLysAsnGlnPheLysLeu 50
2710 TAGAGGTATATGAGGTAGGTAGGTATATGATTAATATATATATATAT 2759
51 ThrSerSerAlaAsnSerLysIleArgValThrGlnAsnGlnAsnIleI 67
2760 ACTAGTTCAGCAATAGTAACTAGATAGAGTCACTCAAAATCAGATATCAT 2809
67 ePheAsnSerValPheLeuAspPheSerValSerPheTyrIleArgIleP 84
2810 ATTAAATAGTGTCTTCTTGTATTTAGCTTACCTTACCTTACCTTACCT 2859
84 rOlystYrLysAsnAspGlyIleGlnAsnTyrIleHisAsnGluTyrThr 100
2860 CTAAATATAAGAAATGATGCTATACAAATATATATATATATATATATAT 2909
101 IleIleAsnCyMetLysAsnAsnSerGlyTyrLysIleSerIleArgG 117
2910 AT 2959
117 YAsnArgIleIleTyrThrLeuIleAspIleAsnGlyLysThrLysSer 134
2960 TAATAGGATAATAGGATTTATATATATATATATATATATATATATATAT 3009
134 alPhePheGluTyrAsnIleArgGluAspIleSerGluTyrIleAsnArg 150
3010 TATTTTGTGAATAATACATAGAGAGATATATATATATATATATATATAT 3059
151 TrpPhePheValThrIleThrAsnAsnLeuAsnAsnAlaLysIleTyrI 167
3060 TGGTTTTTCTACTATATATATATATATATATATATATATATATATATAT 3109
167 eAsnGlyLysLeuLysSerAsnThrAspIleLysAspIleArgGluVal 184
3110 TAATGGTAACTAGATCAATACAGATATTAAGATATATAGAGAGTTA 3159
184 leAlaAsnGlyGluIlePheLysLeuAspLysAspIleAspArgThr 200
3160 TTGCTAATGGTGAATAATATATATATATATATATATATATATATATAT 3209
201 GlnPheIleTyrMetLysTyrPheSerIlePheAsnThrGluLeuSerG 217
3210 CAATTTATTTGGATGAATATTTTCACTATTTTATACGGAATTAAGTCA 3259
217 nSerAsnIleGluArgTyrLysIleGlnSerTyrSerGluTyrLeuL 234
3260 ATCAATATTTGAAGAAAGATATAAATTTCAATCATATAGCGAATATTTAA 3309
234 yAspPheTyrGlyAsnProLeuMetTyrAsnLysGluTyrTyrMetPhe 250
3310 AGATTTTGGGGAATCTTTATATATATATATATATATATATATATATAT 3359
251 AsnAlaGlyAsnLysAsnSerTyrIleLysLeuLysLysAspSerProVa 267
3360 AATGGCGGAATTAATAATTTATATATATATATATATATATATATATATAT 3409
267 lGlyGluIleLeuThrArgSerLysTyrAsnGlnAsnSerLysTyrIle 284
3410 AGCTGAAATTTTAAACACGTAGCAATATATATATATATATATATATATAT 3459
284 sOlyTyrArgAspLeuTyrIleGlyGluLysPheIleIleArgLysSer 300
3460 ATTATAGAGATTTATATATATATATATATATATATATATATATATATAT 3509

301 AsnSerGlnSerIleAsnAspIleValArgLysGluAspTyrIleT 317
3510 AATTCATCTATAAATCATGATATAGTTAGAAAGAGAGATTTATATATA 3559
317 rLeuAspPhePheAsnLeuAsnGlnGluTyrIlePheValTyrThrTyrLys 334
3560 TCTAGATTTTATATTTAAATCAAGAGTGGAGAGATATATACCTATAAAT 3609
334 yPheLysLysGluGluLysLeuPheLeuAlaProIleSerAspSer 350
3610 ATTTAAGAAAGAGAGAAATTTGTTTGTAGCTCTATAGTGATTCT 3659
351 AspGluLeuTyrAsnThrIleGlnIleLysGluTyrAspGluGlnProth 367
3660 GATGAGTCTTACATATATACAAATTAAGAAATATGATGAACAGCCAAC 3709
367 rTyrSerCysGlnLeuPheLysAspGluLysAspGluLysSerThrAspGlu 384
3710 ATATAGTTTGTAGTGTCTTTTAAAGAGATGAAGAAAGTACTGATGAGA 3759
384 leGlyLeuIleGlyIleHisArgPheTyrGluSerGlyIleValPheGlu 400
3760 TAGGATTTGATTTGATTTCTTCTAGCAATCTGGANTTTGATTGAA 3809
401 GluTyrLysAspTyrPheCysIleSerLysTyrTyrIleLysGluVal 417
3810 GAGTATATAAGATTTATTTTGTATAGTAATGCTACTTTAAAGAGGTAA 3859
417 sArgLysProTyrAsnLeuLysGlyCysAsnTyrGlnPheIlePro 434
3860 AAGCAACCATATAATTTTAAATTTGGATGTAATTTGGCAGTTTATCTTA 3909
434 yAspGluGlyTyrThrGlu 440
3910 AAGATGAAGGTGGAGTGA 3929
seq_name: gb_ba:AF295926
seq_documentation_block:
LOCUS AF295926 3876 bp DNA linear BCT 02-SEP-2001
DEFINITION Clostridium botulinum neurotoxin type B gene, complete cds.
ACCESSION AF295926
VERSION AF295926.1 GI:15419707
KEYWORDS
SOURCE Clostridium botulinum.
ORGANISM Clostridium botulinum
Bacteria; Firmicutes; Bacillus/Clostridium group; Clostridiaceae;
REFERENCE 1 (bases 1 to 3876)
AUTHORS Kirma, N., Ferreira, J.L. and Baumstark, B.R.
TITLE Characterization of six type A strains of Clostridium botulinum
that contain type B toxin gene sequences
JOURNAL Unpublished
REFERENCE 2 (bases 1 to 3876)
AUTHORS Kirma, N., Ferreira, J.L. and Baumstark, B.R.
TITLE Direct Submission
JOURNAL Submitted (14-AUG-2000) Department of Biology, Georgia State
University, P.O. Box 4010, Atlanta, GA 30302-4010, USA
FEATURES
SOURCE
1. .3876
/organism="Clostridium botulinum"
/isolate="1436"
/db_xref="taxon:1491"
/country="USA: Utah"
/note="Isolated from stool sample in 1977
type: AB"
1. .3876
/codon_start=1
/transl_table=11
/product="neurotoxin type B"
/protein_id="AAK97132.1"
/db_xref="GI:15419708"